Remarks

In **Section 2**, the Office Action acknowledges Applicant's claim for the benefit of an earlier filing date. Applicant claimed an earlier filing date of at least as early as 21 May 1998 in a First Amendment, dated 2 August 2004.

The subject matter of the claims of the above-identified Application, amended herein, was also presented in the parent case (U.S. Pat. No. 6,308,162). In particular, the subject matter was presented in the Goal Selection, Constraint Mapping, and Scenario Analysis sections of the parent case beginning at col. 4, line 65, through col. 10, line 45. Accordingly, the previously acknowledged assignment of an effective filing date of at least as early as 21 May 1998 should be sustained.

For the Drawings:

Applicant acknowledges Examiner's approval of the proposed drawing corrections, as set forth in **Section 3** of this Office Action.

For the Specification:

In **Section 4**, this Office Action objects to the specification because the Applicant is to update the continuing data on page 1 with the current status of each of the referenced applications.

The Examiner is respectfully invited to review paragraph [0001] of the replacement specification submitted in connection with an Amendment dated 2 August 2004. Paragraph [0001] was amended at that time to indicate the current status of U.S.

Patent Application Serial No. 09/951,334 as "still pending." To date, the status of Patent Application Serial No. 09/951,334 is unchanged. Accordingly, no modification to paragraph [0001] is being submitted herewith.

Section 5 indicates that Applicant's cooperation is requested in correcting any errors which Applicant may become aware in the specification or drawings. Applicant is unaware of any errors in the specification subsequent to the submission of the replacement specification filed with the Amendment dated 2 August 2004. As such, no further corrections are being submitted herewith.

However, **Section 9.1.1** indicates that a clean version of the Abstract submitted in connection with the 4 August 2004 Amendment cannot be located within the instant file. Hence Applicant is requested to submit a clean version in response to this Office Action.

This Office Action does not indicate that the modifications made to the Abstract in connection with the Amendment dated 2 August 2004 were entered or approved. Consequently, Applicant amends the original Abstract to more closely relate to the subject matter disclosed herein. A clean copy of the replacement Abstract containing all amendments and a marked-up copy of the Abstract are being supplied herewith for the Examiner's review. No new matter is being added.

For the Claims:

Applicant submitted claims 1-8. A first Office Action, dated 12 May 2004, rejected claims 1-8. An Amendment, dated 2 August 2004, canceled claim 8, amended claims 1, 3, 5, and 6, added claim 9, and retained claims 2, 4, and 7 as originally submitted.

This second Office Action, dated 16 November 2004, rejects claims 1-7 and 9. This Amendment cancels claim 9 and amends claims 1-7. Applicant respectfully requests reconsideration in view of the following remarks.

In **Section 6**, the Office Action rejects claims 1-7 and 9 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. **Section 6.1** indicates that in regard to claims 1-5 and 9, although one of ordinary skill at the time of the invention would have known how to accomplish the recited actions/functions from the language of the claims, one of ordinary skill could not determine from the language of these claims whether or not they are making and/or using the claimed invention.

Regarding independent claim 1, the Office Action alleges that from the language of claim 1 the following is unclear:

A) the limitations recited in lines 6-9 do not require that the "primary objective function" being used actually be related to the "set of operational variables" in such a manner that the "set of operational variables" would either (1) permit the "primary goal" to be achieved or not achieved; or (2) be related to the "primary goal" so that these variables would be an indication and/or measure of the enterprise's progress toward the "primary goal".

B) the limitations recited in lines 10-12 do not require that the "strategic constraint function" be related to (1) the "subset of operational variables" in such a manner that the "subset of operational variables" would either (a) permit the "strategic constraint" to be achieved; or (b) be related to the "strategic

constraint" so that these variables would be an indication and/or measure of the enterprise's progress toward or within the "strategic constraints". Alternatively, the limitations recited in lines 10-12 do not require that the "strategic constraint function" be related to (2) the "primary goal" in such a manner that the "strategic constraints" would either (a) permit the "primary goal" to be achieved or not achieved; or (b) be related to the "primary goal" so that the "strategic constraints" would either affect or provide an indication and/or measure of the enterprise's progress toward the "primary goal".

C) the limitation recited in lines 13-15 does not require that the "target values" being used to "optimize the primary objective function" actually be related to the "primary goal" in such a manner that the "target values" would either (1) permit the "primary goal" to be achieved or not achieved; or (2) be related to the "primary goal" so that these "target values" would be an indication and/or measure of the enterprise's progress toward the "primary goal"; or (3) provide an optimized "primary objective function" for the intended purpose.

D) the limitation recited in lines 13-15 does not require that the "target values" being used to determine the "outcomes" actually be related to the "primary goal" in such a manner that the "target values" would either (1) permit the "primary goal" to be achieved or not achieved; or (2) be related to the "primary goal" so that these "target values" would be an indication and/or measure of the enterprise's progress toward the "primary goal"; or (3) permit one of ordinary skill to select the appropriate outcomes of interest.

E) since the limitation recited in lines 13-15 does not require that the "constraint function" be related to the "primary objective function", the graphical view can not be a

visualization of the effective of the "constraint function" on the "primary objective function".

Well-established patent practice dictates that a claim is not required to enable one of ordinary skill to make and use the invention to be considered definite under 35 U.S.C. §112, second paragraph. Rather, the specification is required to describe the invention "in such detail as to enable a person skilled in the most relevant art to make and use it" (In re Naquin, 158 USPQ 317, 319 (C.C.P.A. 1968).

As best understood, the Office Action assessment of the claims indicates that the Examiner fails to recognize relationships between the various elements and operations of the claims, and desires the addition of further limitations to the claims so as to add more precision to them. If the Examiner believes the language of claims 1-7 is unclear, the Examiner is respectfully invited to suggest claim language that might improve the clarity or precision of the language used so as to advance prosecution of the case. However, the Examiner should not reject claims if other mode of expression selected by Applicant satisfies the statutory requirement (Manual of Patent Examining Procedure (MPEP) §2173.02, Rev. 2, May 2004). In this case, Applicant believes that the claim language of amended claims 1-7 indeed satisfies the threshold requirements of clarity and precision.

As further stated in the MPEP, §2173.02:

> The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

(A) The content of the particular application disclosure;
(B) The teachings of the prior art; and
(C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

The above-listed guideline provided in the MPEP does not require that the claim limitations include some sort of achievement, lack of achievement, indication, or measure of an enterprise's progress toward a goal, despite Office Action allegations to the contrary. Rather, when the claims read in light of the supporting specification reasonably apprise one skilled in the art of the use and scope of the invention, and the language of the claims circumscribe the subject matter with a reasonable degree of clarity and particularity, then the claims are definite under U.S.C. §112, second paragraph.

In order to address the Office Action concerns, Applicant has amended independent claim 1 so as to further clarify some elements of the claim. However, as further discussed below, some portions of claim 1 have not been amended, Examiner's objections notwithstanding. Rather, the section of the specification most clearly describing the claim limitation will be pointed out to the Examiner so that the claim can be properly analyzed in light of the specification.

As to the Office Action assertion A) regarding the selecting operation recited in lines 6-9, the primary objective function depends upon a set of operational variables and the primary objective function represents the primary goal. Accordingly, the primary goal, primary objective function and set of operational variables are interrelated. Support for this limitation can be found in Applicant's specification at paragraphs [0081] and [0082]. In addition, each of the operational variables of the set of operational variables

represents a single operational decision that the user seeks to optimize in order to reach the primary goal (paragraph [0031]).

Similarly, as to the Office Action assertion B) regarding the representing operation recited in lines 10-12, the strategic objective function depends upon a subset of operational variables and the strategic objective function represents the strategic constraint. Accordingly, the strategic constraint, strategic objective function, and subset of operational variables are interrelated. In addition, since the subset of operational variables is a subset (i.e., a set whose members are members of another set) of the set of operational variables, the two are interrelated. Support for this limitation can be found in Applicant's specification at paragraphs [0084] through [0086].

Claim 1 has been amended to include the further limitation of constructing an effective objective function by combining the primary objective function and the constraint function. Support for this limitation can be found in Applicant's specification in connection with Constraint Mapping at paragraphs [0109] through [0111]. Construction of an effective objective function is further discussed in connection with Scenario Analysis at paragraphs [0139] through [0141]. Both sections of the specification provide a clear teaching of how the effective objective function may be formed.

Construction of the effective objective function establishes a relationship between the primary objective function and the constraint function. Moreover, since the primary objective function depends upon a set of operational variables and the constraint function depends upon a subset of the set of operational variables, it follows that the combination of the primary objective function and the constraint function will

indeed contain the required operational variables, despite Office Action allegations to the contrary (discussed in the Office Action in connection with claim 5).

The optimizing operation of claim 1 has been amended to recite optimizing the effective objective function over a range of target values for the constraint function to obtain operational decisions for the operational variables. This is as discussed in connection with Scenario Analysis at paragraphs [0131] through [0145]. That is, the user selects (target) values for the strategic objective (strategic constraint) that the user would like to see attained. The effective objective function is optimized over this range of target values with respect to the independent variables. The output from the optimization routine includes the optimized values of the independent variables, such as the price and quantity for each item, and the resulting values of the objective function and constraint function. The values of the variables, the objective function, and the constraint function are stored in a target value table.

The determining operation of claim 1 has been amended to recite determining, from the optimizing operation, a plurality of outcomes of the primary objective function in response to the range of target values. Paragraph [0141] teaches that the output from the optimization routine includes among other things, the resulting values of the objective function (i.e., determining a plurality of outcomes of the primary objective function).

The presenting operation of claim 1 has been amended to recite presenting a graphical view of the plurality of outcomes of the primary objective function versus values of the constraint function corresponding to the target values such that

effects of the strategic constraint on the primary goal can be readily perceived by a user to manage the enterprise. Paragraph [0141] teaches that the output from the optimization routine includes, among other things, the resulting values of the constraint function. The resulting constraint value is the one that most closely matches the target constraint value. Paragraph [0146] discusses an example illustrated in Figure 16 of a graphical view that shows how the primary goal (i.e., predicted profits from a demand model) could vary according to the strategic constraint (price image). In particular, the exemplary curve in Figure 16 illustrates the outcomes (i.e., predicted profits) of the primary objective function versus values (price image) of the constraint function. Paragraph [0146] further teaches of how a manager can utilize the information in the graphical view to manage an enterprise.

Regarding claim 2, claim 2 recites wherein the target values within the range of target values represent scenarios for the strategic constraint. Support for this limitation can be found in Applicant's specification at paragraph [0131]. These values for the strategic objective (i.e., strategic constraint) are values that the user would like to see attained. Regarding claim 3 which depends from claim 2, claim 3 was amended to delete a selecting operation. Claim 3 recites, for each of the set of scenarios, providing a set of the operational decisions for the operational variables that optimize the primary goal while concurrently satisfying the strategic constraint. Claim 4 was amended to include the limitations of enabling the user to target one of the scenarios from the set of scenarios to be realized within the enterprise and providing the set of operational decisions associated with the scenario to the user. Claim 5 was amended to delete the forming operation, in lieu of the constructing operation of amended independent claim 1. Claim 5 was further amended to include the limitation of

outputting operational decisions for the set of operational
variables that optimize the objective function while
concurrently satisfying the target values for the constraint
function. The limitations of claims 2-7 are also taught in
connection with the Scenario Analysis routine of paragraphs
[0131] through [0145].

For the reasons set forth above, Applicant believes that the
language of the claims circumscribes the subject matter with a
reasonable degree of clarity and particularity. Moreover, when
the claims are read in light of the disclosure, the claims
reasonably apprise one skilled in the art of the use and scope
of the invention. Consequently, Applicant believes that claims
1-7 are definite, and respectfully requests withdrawal of the
rejection of claims 1-7 under 35 U.S.C. §112, second paragraph.

In **Section 7**, the Office Action examines claims 1-7 and 9 in
light of the provisions of 35 U.S.C. §101.

Section 7.1 (and subsections 7.1.1 through 7.1.7): alleges
that claims 1-7 and 9 are rejected under 35 U.S.C. §101 because
the invention as claimed is directed to non-statutory subject
matter. In particular, the Office Action asserts that the claims
are directed to a hypothetical mental exercise that merely
manipulates an abstract idea without a claimed practical
application of the mathematics or abstract idea.

Section 7.2 (and subsections 7.2.1 through 7.2.3): claims 1-7
and 9 are rejected under 35 U.S.C. §101 since they allegedly
recite a series of inoperative steps. More particularly, this
Office Action alleges that the claims are directed to a series of
steps/actions/functions, in which as set forth above in regard to
the rejection of the claims under 35 U.S.C. §112, second

paragraph, the recited limitations are not clearly interconnected to one another and therefore do not provide a useful method/process within the meaning of process as used in 35 U.S.C. §101.

Section 7.3: claims 1-7 and 9 are rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter, since they allegedly fail to comply with the "requirements this title, namely 35 U.S.C. §112, 2nd paragraph as set forth above and 35 U.S.C. §102 as set forth below."

Claims 1-7 have been amended to more clearly point out Applicant's invention. In particular, amended independent claim 1 recites a computer program executable by a processor, and the computer program instructs the processor to perform a number of recited operations. In addition, the presenting operation was amended to recite presenting a graphical view of a plurality of outcomes of the primary objective function versus values of the constraint function corresponding to target values of the constraint function such that effects of the strategic constraint on the primary goal can be readily perceived by a user to manage the enterprise.

The modifications to claim 1 to incorporate technology, i.e., a computer program executable by a processor, and to present a graphical view of a plurality of outcomes of the primary objective function versus values of the constraint function corresponding to target values of the constraint function yield a claimed invention that produces a concrete and tangible result. That is, the invention calculates a plurality of outcomes and presents the results in a graphical view so that the effects of the strategic constraint on the primary goal can be readily perceived, or visualized, by a user. Since the

claimed subject matter is "tangible and concrete," focus can then be directed towards its practical usefulness.

The specification sets forth reasons that explain why the invention is believed useful. The invention of amended claim 1 does not merely define a series of steps to be performed on a computer. Rather, the invention of claim 1 yields a real-world result, a graphical view of outcomes of the primary objective function of an enterprise planning model versus values of the constraint function. The invention of claim 1 presents to the user an intuitive graphical view of the dependence of the primary goal on the strategic constraint. By visualizing this dependence, the manager has advance knowledge of an effect that the strategic constraint might have on the primary goal. This allows the user to see the tradeoffs involved in setting different strategic constraints when managing the enterprise (paragraph [0027]), with the idea that the selected tradeoff will actually produce a benefit in the long run. An enterprise planning model, into which the invention of claim 1 is incorporated, is thus useful for facilitating the selection of a strategy based on visualizing the effect of such a strategy. Consequently, strategic planning performed by a user, and its implications, is significantly enhanced with this graphical view.

In addition, and as discussed above, the recited limitations are interconnected with one another, and the language of the claims circumscribe the subject matter with a reasonable degree of clarity and particularity, when read in light of the specification. Accordingly, the claims are definite, thus comply with the requirements of U.S.C. §112, second paragraph, and are thus directed to statutory subject matter.

Accordingly, Applicant's invention of claim 1 is indeed directed toward statutory subject matter. Amended claims 2-7

depend directly or indirectly from claim 1. As such, claims 2-7
are also directed toward statutory subject matter. Thus,
Applicant respectfully requests withdrawal of the associated
rejection of claims 1-7 under the provisions of 35 U.S.C. §101.

In **Section 8**, the Office Action examines claims 1-8 in light
of the provisions of 35 U.S.C. §102. Subsections of **Section 8**
specify the U.S.C. §102 rejections as follows:

Section 8.1: rejects claims 1-7 and 9 under 35 U.S.C. 102(b)
as being clearly anticipated by *O'Brien*, International
Publication Number WO 95/26007. *O'Brien* teaches of a method for
determining a travel scheme that minimizes travel costs for an
organization.

Since claim 9 has been cancelled, claim 9 is removed from
further consideration herein.

In regard to claims 1-7, the Office Action indicates that
O'Brien largely teaches Applicant's invention of claim 1. In
particular, the Office Action alleges that *O'Brien* teaches of
selecting a primary goal (travel model) that would minimize the
travel/economic costs incurred by an enterprise. The Office
Action alleges that the primary goal or objective function would
include considerations about business related travel
requirements. Whereas, the strategic constraint function would
be bounded or limited by target values, such as the
economic/fiscal resources of the enterprise as well as any
operational constraints of the enterprise.

The Office Action speculates that when these two functions
are combined to optimize the selected primary goal of the
enterprise, then the result would be one or more different

models/scenarios that would satisfy the primary goal of the
enterprise. The Office Action further speculates that if
multiple scenarios result, then the resultant scenarios must be
presented to someone or something in a suitable form so that the
scenario may be selected that if implemented, would achieve the
primary goal of the enterprise.

At issue here is when given a fair reading, does the prior
art teach or suggest all of Applicant's limitations of amended
independent claim 1. Despite Office Action allegations to the
contrary, Applicant contends that O'Brien fails to teach or
suggest of a strategic constraint represented by a constraint
function, as recited in amended independent claim 1. Nor does
O'Brien teach or suggest an effective objective function
constructed by combining a primary objective function and the
constraint function, and optimizing the effective objective
function over a range of target values for the constraint
function. In the absence of any teaching or suggestion, O'Brien
cannot anticipate nor render obvious Applicant's invention of
claim 1.

It is unclear what is meant by the Office Action allegation
that the "primary goal or objective function would include
considerations about business related travel requirements."
Moreover, it is unclear as to how that allegation relates to the
claim limitation of selecting the primary goal of the enterprise
planning model, the primary goal being represented by a primary
objective function, and the primary objective function depending
upon a set of operational variables. Accordingly, Applicant
cannot respond directly to the allegation. It also unclear as to
what is meant by the Office Action assertion that the "strategic
constraint function would be bounded or limited by target values,
such as the economic/fiscal resources of the enterprise as well
as any operational constraints of the enterprise."

The claimed strategic constraint, represented by a constraint function" should be examined in light of Applicant's specification. As described in Applicant's specification at paragraph [0027], unlike the primary objective and the tactical or physical constraints, strategic objectives (i.e., constraints) are not fixed or known in advance. Strategic constraints depend upon on the manager's judgment; they represent strategic decisions where the manager must consider one or more tradeoffs that may be taken with the idea being that the tradeoff will produce a benefit in the long run. Applicant's specification further teaches at paragraph [0102] that because a strategic constraint does not represent a physical restriction on the system, it is not necessary that it be met rigorously. The object is to have control over the decision being made without being locked to a single set of decisions. For this reason, it is not practical to use conventional constraint-based optimizations, which are usually employed for physical constraints.

O'Brien discloses a method in which a travel scheme is determined that minimizes travel costs for an organization. O'Brian constructs an objective function representing a travel cost and constructs a set of constraints that are restrictions related to the objective function (see Abstract). These constraints include, for example, a link demand constraint 78 (i.e., the sum of the trips to be purchased from each carrier for a particular link must equal the passenger demand), a carrier supply constraint 80 (i.e., a value requiring that for a particular carrier, the sum of the number of trips to be purchased from that carrier for all links be either above or below that value), and a carrier goal constraint 82 (i.e., that represents a predetermined goal that the organization may have with respect to the carrier).

The link demand constraint 78, carrier supply constraint 80, and carrier goal constraint 82 represent physical restrictions on the system. Accordingly, O'Brien teaches of conventional constraint-based optimization. This is contrary to Applicant's invention of claim 1 in which the strategic constraint is represented by a constraint function that does not represent a physical restriction on the system, as defined in Applicant's specification. Consequently, any teaching of constraints comprising restrictions related to the objective function, and more particularly, the O'Brien link demand, carrier supply, and carrier goal constraints, fails to anticipate or render obvious Applicant's strategic constraint represented by a constraint function.

O'Brien further fails to teach or suggest of constructing an effective objective function by combining a primary objective function with the constraint function, and optimizing the effective objective function over a range of target values for the constraint function, as recited in claim 1. Rather, O'Brien mentions applying the constraints to the objective function. O'Brien shows an exemplary objective function on page 16, beginning at line 25. Constraint functions for five link demand constraints 78 are shown on page 17, beginning at line 15. Constraint functions for two carrier goal constraints 82 are shown on page 18, beginning at line 3, and constraint functions for three carrier supply constraints 80 and/or carrier goal constraints 82 are further shown on page 18, beginning at line 26. Each function is shown to equal one particular preset value. This preset value, i.e., the constraint, is used to construct the constraint function (see page 17, lines 6-19). Since these constraints represent physical restrictions on the objective function, they cannot be varied over a range of target values (as recited in claim 1), but instead must be held constant.

It is Applicant's specification and not the prior art which
teaches of a strategic objective represented by a constraint
function, constructing an effective objective function by
combining a primary objective function and the constraint
function, and optimizing the effective objective function over a
range of target values for the constraint function, as recited in
claim 1. Applicant has discovered that incorporation of a
strategic constraint into an enterprise planning model by
constructing and optimizing an effective objective function over
a range of target values for the constraint function allows a
user to visualize the effect that the strategic constraint might
have upon the primary goal when managing an enterprise.

O'Brien is not concerned with strategic constraints. To read
a strategic constraint represented by a constraint function and
the claimed constructing and optimizing of an effective objective
function into the O'Brien reference, despite the lack of
description or suggestion in the O'Brien specification amounts to
speculation. Such a mischaracterization of the prior art
provides evidence that hindsight obtained from Applicant's
specification has been used against its teacher.

Further speculation is present in the Office Action assertion
that if multiple scenarios result, the resultant scenarios must
be presented in a suitable form that the scenario may be selected
that if implemented would achieve the primary goal of the
enterprise. *O'Brien* discloses applying the constraints to the
objective function to determine <u>a solution</u> of the objective
function that satisfies the constraints and that minimizes the
travel costs of the organization (page 19, lines 5-11). O'Brien
additionally expressly discloses through linear programming, the
cost of a first test travel scheme is determined. The process is

repeated to provide and determine the cost of the second test travel scheme. The two costs are subsequently compared. The process is repeated until an optimum travel scheme minimizing the travel costs is determined (page 19, lines 20-32). The single solution is then organized into a table as shown in Figure 6. Accordingly, *O'Brien* fails to present a graphical view of a <u>plurality of outcomes</u> of the primary objective function versus values of the constraint function corresponding to the target values of the constraint function. Consequently, *O'Brien* does not teach or suggest the presenting operation of amended independent claim 1.

For the reasons set forth above, Applicant believes that O'Brien fails to anticipate or render obvious Applicant's invention of amended independent claim 1, and that claim 1 should now be found allowable. Claims 2-7 depend directly or indirectly from claim 1, and are also allowable for the reasons set forth above. Thus, Applicant respectfully requests withdrawal of the rejection of claims 1-7 under 35 U.S.C. 102(b).

Section 8.2: rejects claims 1-8 under 35 U.S.C. 102(e) as being clearly anticipated by *Kosiba et al.*, U.S. Publication Number 2002/0184069 (hereinafter *Kosiba*). *Kosiba* was filed on 17 May 2002 and claims priority to U.S. Provisional Application No. 60/291.325, filed 17 May 2001.
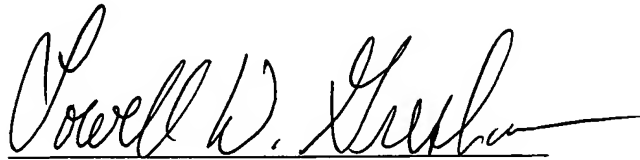
As discussed above and as acknowledged in this Office Action, the subject matter of claims 1-7, as amended herein, should be assigned the benefit of an effective filing date of at least as early as 21 May 1998. An effective filing date of 21 May 1998 predates the *Kosiba* Provisional Application No. filing date of 17 May 2001. Consequently, *Kosiba* is not prior art to the present

application. Therefore, Applicant respectfully requests withdrawal of the rejection of the claims in view of *Kosiba*.

Accordingly, this Amendment cancels claim 9, and amends claims 1-7. Currently amended claims 1-7 remain in the application and are believed to be allowable.

Applicant believes that the foregoing amendments and remarks are fully responsive to the rejections and/or objections recited in the 16 November 2005 Office Action and that the present application is now in a condition for allowance. Accordingly, reconsideration of the present application is respectfully requested.

Respectfully submitted,

Lowell W. Gresham
Attorney for Applicant
Reg. No. 31,165

Lowell W. Gresham
5727 North Seventh Street
Suite 409
Phoenix, AZ 85014
(602) 274-6996